**Product Flier**
PF51.3:Vee-Ball
D102429X012
May 2009



# Fisher® High-Capacity Rotary Valves for General or Fibrous Slurry Service

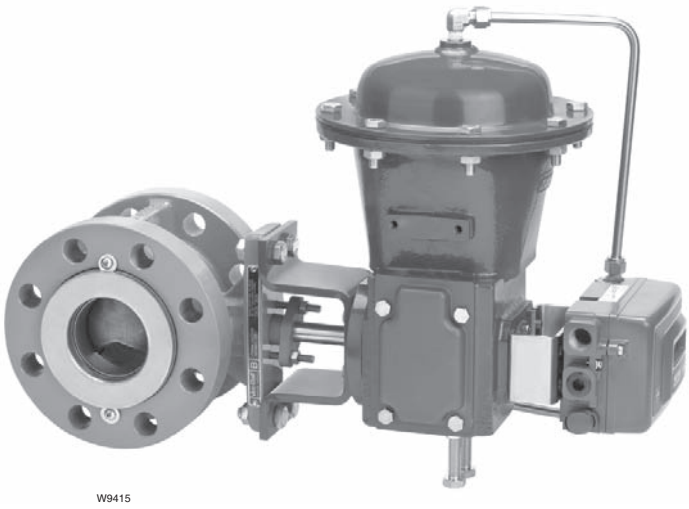



*Figure 1. Fisher High-Capacity Rotary Valve*

**• Rotary valve efficiency with globe valve ruggedness for general gas, steam, or liquid service and for fibrous slurry applications**

**• DN 25 to DN 300 and NPS 1 to 24 x 20**

**• Choice of seal types and materials—composition, flat metal, heavy-duty metal, or flow ring**

**• Temperatures to 427°C**

**• Pressures to PN40 and CL600**

**• ENVIRO-SEAL™ packing systems to help ensure compliance with environmental emissions requirements**

**• FIELDVUE™ digital valve controllers offer digital control and remote diagnostics. The proven line of Fisher positioners, controllers, transmitters, and switches also is available.**

## The Fisher Vee-Ball™ Valve Family

**Vee-Ball** rotary valves combine the features and performance you need. These features are made available through expertise in applications, valve design, and manufacturing.

The valves are suitable for throttling or on-off service. They are often used with a full 0 to 90 degree ball rotation.

**Fisher** V150, V200, and V300 Vee-Ball valves use the time-proven V-notch ball that provides high-capacity control of liquid, gas, steam, and fibrous slurries. The shearing action of the ball allows smooth, non-clogging operation, and the unrestricted, straight-through flow ensures high capacity.

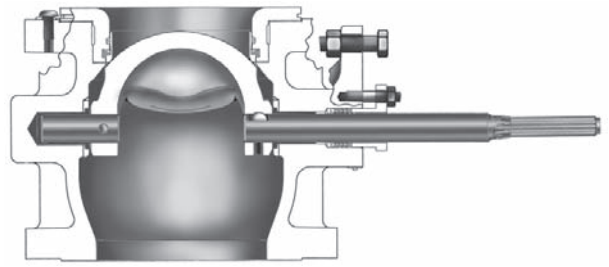
**Easy Installation . . .** Fisher V150 and V300 integral flanges eliminate exposed flange studs, and the V200 features line-centering lugs to simplify alignment.

**High Rangeability . . .** Flow coefficient ratio is 300 to 1.

**Reduced Maintenance Costs . . .** The V150, V200, and V300 valves have interchangeable trim parts to reduce spare parts inventory and cost and simplify maintenance procedures and training. Metal and soft seals are interchangeable within a valve body.

**Protection Against Process Fluid Emissions . . .** Optional ENVIRO-SEAL packing systems provide an excellent shaft seal to prevent the loss of valuable or hazardous process fluids. These live-loaded systems provide long packing life and reliability.

**Materials for Sour Service . . .** Emerson Process Management offers materials and manufacturing procedures for compliance with NACE (National Association of Corrosion Engineers) standard NACE MR0175–2002, MR0103, and MR0175 / ISO 15156.



W74351/IL

*Figure 2. Fisher V150 or V300 Valves*

**Easy Seal Inspection . . .** Seals can be inspected without removing the actuator or disassembling the valve.

**Noise Attenuator Ball. . .** Depending on service conditions, up to -10dBA acoustical attenuation and a $K_C$ of 1.0 for liquid flow are possible with the noise attenuator ball (available with DN 100 through DN 300 and NPS 4 through 20 valves).

**Basis Weight Control Valve . . .** Fisher V150, V200, and V300 valves are available to meet the precision control requirements of basis weight control in the paper-making industry.

### Other Rotary Products

**Fisher V500 Valve . . .** The V500 valve uses rugged valve components and a choice of erosion-resistant trim materials for highly erosive and severe operating conditions at pressures to PN 100 (CL600) and temperatures to 538°C.

**Fisher CV500 Valve . . .** The CV500 combines the rangeability of the cammed-segmented V-notched ball, with the inherent ruggedness found in the V500 heavy duty bearings, seals and body. This combination provides a balance of high capacity, erosion resistance, and pressure control for liquid and gas.

## The Fisher Vee-Ball Valve Family (Continued)

**Other Rotary Products (Continued)**

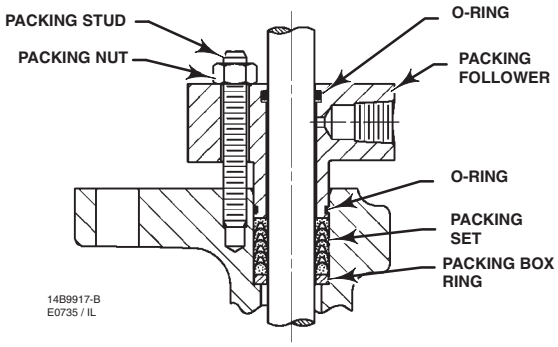
**Fisher V250 . . .** The V250 valve is a heavy-duty valve often used in gas transmission lines, gas distribution, or liquid pipelines. It is available in sizes to NPS 24 and CL600 or CL900 pressure-temperature ratings.

**Fisher V260 . . .** The V260 valve has special energy-dissipating trim to reduce noise effects that cause pipeline vibrations. It is available in NPS 8, 10, 12, 16, 20, and 24 sizes.

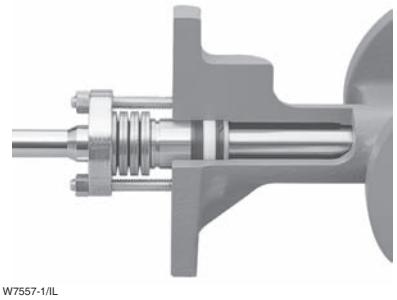
**Fisher Control-Disk™ Valve . . .** This rotary valve with an equal percentage flow characteristic provides an improved throttling range. This improved capability allows you to control closer to the target set point, regardless of process disturbances. This capability results in a reduction in process variability.

**Fisher 8532, 8580, and 8510/8510B . . .** This family of high performance butterfly valves is designed for optimal control performance, as well as tight shutoff isolation service. These valves are available in size range NPS 2 to 24 and a variety of pressure classes and body styles.

**Fisher A11** . . . The POSI−SEAL™ A11 high-performance butterfly valves are designed for optimal control performance as well as tight shutoff for isolation, automated on/off service. These valves feature square, keyed, or splined shafts. These valves are designed for use in high−pressure, high−temperature, or cryogenic applications, and available in sizes NPS 3 through 72, and pressure classes up to CL2500.




**LEAK-OFF PACKING ASSEMBLY FOR NPS 1 THROUGH 12 VALVES**




**ENVIRO-SEAL PACKING SYSTEM (SINGLE PTFE V-RING)**

*Figure 3. Optional Rotary Valve Packing Assemblies*

**Vee-Ball VALVE BALL WITH ATTENUATOR**

**BASIS WEIGHT VALVE AND ACTUATOR**

*Figure 4. Attenuator and Basis Weight Valve*

## Selecting Vee-Ball Products

Only a few of the more commonly selected product materials, sizes, options, and accessories are covered in this flier.

Contact your Emerson Process Management sales office (refer to the back cover) for assistance in selecting and sizing these products. More detailed specifications are available on request.

**Selecting Valve Components**
- Valve Type Selection . . . . . 5
- Body Materials, End Connections, and Ratings . . . . . 7
- Valve Component Materials and Temperatures . . . . . 7

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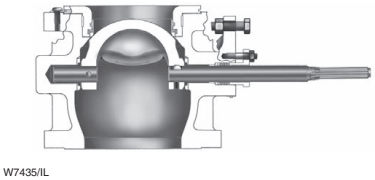
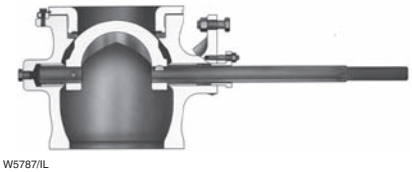
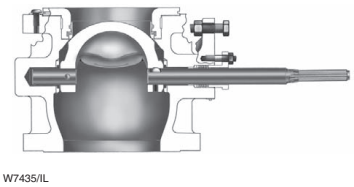
## Fisher Vee-Ball Valves




**V150 VALVE**




**V200 VALVE**



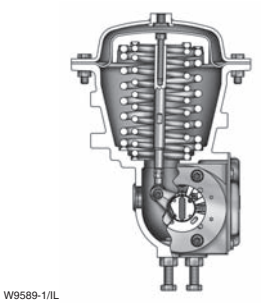

**V300 VALVE**

*Figure 5. Fisher Vee-Ball Valves*

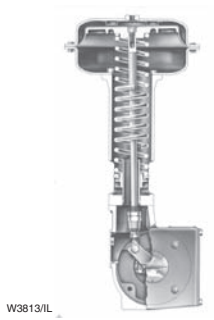
*Table 1. Vee-Ball Valves*

| V150 | V200 | V300 |
|---|---|---|
| **Applications** | | |
| Excellent for fibrous slurries as well as liquids, gas, and steam. Shearing V-notch ball for smooth, non-clogging action. | Excellent for fibrous slurries as well as liquids, gas, and steam. Shearing V-notch ball for smooth, non-clogging action. | Excellent for fibrous slurries as well as liquids, gas, and steam. Shearing V-notch ball for smooth, non-clogging action. |
| **Sizes** | | |
| **V150:** DN 25 - 500 or NPS 1 - 24 x 20 | NPS 1, 1-1/2, 2, 3, 4, 6, 8, 10 | DN 25 - 500 or NPS 1 - 20 |
| **Ratings** | | |
| **V150:** PN 10/16 or CL150 | CL150, CL300, or CL600 depending on size. | PN 25/40 or CL300 |
| **End Connections** | | |
| Raised-face (RF) flanged | Flangeless | Raised-face (RF) flanged |
| **Valve Body Materials** | | |
| **EN:** 1.0619 steel, 1.4409 stainless steel, M35-1, or CW2M<br>**ASME:** SA216 WCC steel, SA351 CF3M, CF8M stainless steel, M35-1, or CW2M | **EN:** 1.0619 steel, 1.4409 stainless steel, M35-1, or CW2M<br>**ASME:** SA216 WCC steel, SA351 CF3M, CF8M stainless steel, M35-1, or CW2M | **EN:** 1.0619 steel, 1.4409 stainless steel, M35-1, or CW2M<br>**ASME:** SA216 WCC steel, SA351 CF3M, CG8M stainless steel M35-1, or CW2M |
| **Ball Material** | | |
| SA351 CF3M, or CG8M, CG8M stainless steel, CW2M | SA351 CF3M or CG8M stainless steel, CW2M | SA351 CF3M, or CG8M stainless steel, CW2M |
| **Seal Types** | | |
| TCM Plus, metal (S31600), HD (heavy duty) metal, or flow ring | TCM Plus, metal (S31600), HD (heavy duty) metal, or flow ring | TCM Plus, metal (S31600), HD (heavy duty) metal, or flow ring |
| **Flow Characteristics and Maximum Flow Coefficients** | | |
| Modified equal percentage<br>Maximum Cv from 3.64 to 10,300 | Modified equal percentage<br>Maximum Cv from 8.4 to 3000 | Modified equal percentage<br>Maximum Cv from 8.4 to 10,300 |
| **Rangeability** | | |
| 300 to 1 | 300 to 1 | 300 to 1 |
| **Shutoff Class** | | |
| **Composition Seal:** Class VI<br>**Metal Seal:** Class IV<br>**Flow Ring Construction:** 5% of wide-open capacity | **Composition Seal:** Class VI<br>**Metal Seal:** Class IV<br>**Flow Ring Construction:** 5% of wide-open capacity | **Composition Seal:** Class VI<br>**Metal Seal:** Class IV<br>**Flow Ring Construction:** 5% of wide-open capacity |
| **Available Actuators (refer to page 8)** | | |
| Fisher 2052, 1051, 1052, 1061, and FieldQ | Fisher 2052, 1051, 1052, 1061, and FieldQ | Fisher 2052, 1051, 1052, 1061, and FieldQ |

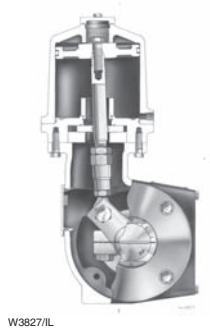
## Fisher Actuators




**2052 ACTUATOR**




**1051 AND 1052 ACTUATORS**




**1061 ACTUATOR**

*Figure 6. Fisher Rotary Valve Actuators*

*Table 2. Fisher Rotary Valve Actuators*

| 2052 | 1051 AND 1052 | 1061 |
|---|---|---|
| **Features** | | |
| Heavy-duty actuator with enclosed linkage and splined actuator-valve connection for minimized lost motion | | |
| **Style** | | |
| Spring-return pneumatic diaphragm actuator | Spring-return pneumatic diaphragm actuator | Double-acting pneumatic piston actuator |
| **Typical Operating Torque Range (Varies with Operating Pressure and Construction)** | | |
| 50.8 to 565 N•m | 85 to 1370 N•m | 282 to 19,800 N•m |
| **Accessories** | | |
| Pneumatic or electro-pneumatic valve positioners, FIELDVUE digital valve controllers, limit switches, position transmitters, handwheels, travel stops, lock-out device to disable actuator during maintenance, supply pressure filter-regulator. | | |

## Valve Component Materials and Temperatures

*Table 3. Valve Component Materials and Temperatures*

| BODY, SHAFT, AND BALL (TEMPERATURE IS DETERMINED BY OTHER PARTS LISTED BELOW) | | | | |
|---|---|---|---|---|
| **Valve Body** | ■ CF3M (316L stainless steel), ■ DIN 1.0619 steel, ■ WCC steel, or ■ CG8M (317 stainless steel) | | | |
| **Valve Shaft** | ■ S20910 or ■ S17400 (17-4PH stainless steel) | | | |
| **V-Notch Ball** | ■ CF3M (316L stainless steel), ■ chromium-plated CF3M, ■ CG8M (317 stainless steel), or ■ chromium-plated CG8M | | | |
| **SEAL, BEARING, AND PACKING** | | | | |
| **SEAL MATERIAL** | **BEARING MATERIAL** | **MAXIMUM TEMPERATURE, °C** | | **NOTES** |
| | | **PTFE V-Ring Packing** | **Graphite Packing** | |
| Composition (TCM plus) | ■ PEEK (poly-ether-ether-ketone)/PTFE, ■ R30006 (alloy 6B) or ■ silver-plated R30006 | 232 | 232 | ■ Minimum temperature for DIN valve bodies is −10°C<br>■ Minimum temperature for ASME constructions is −29°C for steel valves and −46°C for stainless steel valves<br>■ Contact your Emerson Process Management sales office for ENVIRO-SEAL packing temperatures and pressures<br>■ Contact your Emerson Process Management sales office for pressure drops and temperatures with TCM-Ultra composition seal. |
| Flat metal—(spring-tempered stainless steel) (available on DN 80 through 300 [NPS 3 through 12] only) | PEEK/PTFE | 232 | 260 | |
| | ■ R30006, ■ silver-plated R30006, or ■ S31600L (316L stainless steel) nitride | 232 | 427 | |
| HD (heavy-duty) metal (■ CF10SMnN or ■ CD7MCuN [alloy 255 duplex stainless steel], or ■ R30006 | PEEK/PTFE | 232 | 260 | |
| | ■ R30006, ■ silver-plated R30006, or ■ S31600L nitride | 232 | 288 | |
| Flow ring (steel or stainless to match body material) | PEEK/PTFE | 232 | 260 | |
| | ■ R30006, ■ silver-plated R30006, or ■ S31600L nitride | 232 | 427 | |
| **OTHER PARTS** | | | | |
| **PART** | **MATERIAL** | **MAXIMUM TEMPERATURE, °C** | | |
| | | **PTFE V-Ring Packing** | **Graphite Packing** | |
| Wave spring and radial seal (HD metal only) | N07750 and PTFE with N10276 | Temperature is determined by parts listed above | | |
| Micro-notch V-notch ball for DN 25 (NPS 1) | Chromium-plated CG8M or solid alloy 6 | | | |
| | Solid VTC ceramic | 93 | 93 | |
| Gasket | Graphite | Temperature is determined by parts listed above | | |
| Optional line bolting | ■ B7, ■ B7M, or ■ strain-hardened B8M | | | |

**COMPOSITION SEAL** **HD (HEAVY-DUTY) METAL SEAL** **FLAT METAL SEAL**

*Figure 7. Fisher Vee-Ball Seals*

## Fisher 2052 Diaphragm Actuators

The 2052 pneumatic diaphragm rotary actuators are compact, spring-return actuators that provide reliable operation for the valves in this flier.

The 2052 actuator mountings conform to ISO 5211; the actuator can be mounted directly to non-spline shafts, such as square or double-D, allowing the actuator to be paired with a wider range of valves to be used for both automated on/off and throttling applications.

This actuator features single-joint linkage with splined-and-clamped levers for minimum lost motion and high control accuracy.

It also features a nested spring design, which requires no bench set, simplifying the actuator selection process.

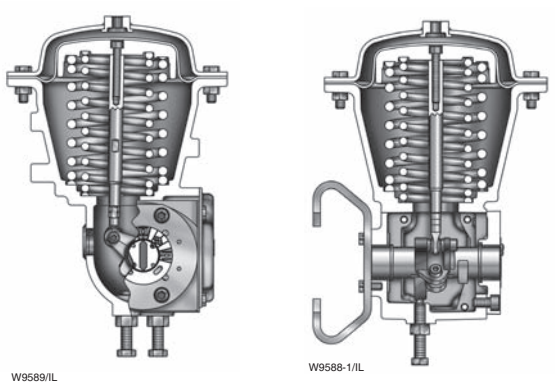



*Figure 8. Fisher 2052 Actuator*

**Options** . . . ■ Top-mounted handwheel, ■ Fisher 1078 declutchable handwheel actuator, and ■ actuator locking mechanism

**Accessories** . . . ■ Pneumatic and electro-pneumatic positioners, ■ FIELDVUE digital valve controllers, and ■ Limit and proximity switches.

*Table 4 .Fisher 2052 Actuator Specifications*

| 2052 ACTUATOR SIZE | NOMINAL OPERATING PRESSURE RATINGS | | MAXIMUM CASING PRESSURE | | MAXIMUM VALVE BREAKOUT TORQUE, N•m | AMBIENT TEMPERATURE, °C | MATERIALS |
|---|---|---|---|---|---|---|---|
| | Bar | Psig | Bar | Psig | | | |
| 1 | 2-3 | 30-43 | 5.0 | 73 | 28 | –40 to 80 | **Upper Casing:** Steel<br>**Housing:** Cast Iron<br>**Diaphragm:** Nitrile and nylon is standard; silicone and polyester low-temperature is optional<br>**Lever:** Ductile iron<br>**Diaphragm Plate:** Cast iron |
| | 4-5 | 60-72 | 5.0 | 73 | 50.8 | | |
| 2 | 2-3 | 30-43 | 5.0 | 73 | 104 | | |
| | 4-5 | 60-72 | 5.0 | 73 | 209 | | |
| 3 | 2-3 | 30-43 | 5.0 | 73 | 270 | | |
| | 4-5 | 60-72 | 5.0 | 73 | 565 | | |

## Fisher 1051 and 1052 Diaphragm Actuators

The 1051 and 1052 pneumatic diaphragm rotary actuators are spring-return actuators that provide reliable operation for the valves in this flier.

The 1051 actuator is suitable for on-off operation or for throttling operation when equipped with a valve controller or positioner. The 1052 actuator is suitable for on-off or throttling with or without a controller or positioner.

These actuators feature single-joint linkage with splined-and-clamped levers for minimum lost motion and high control accuracy. The actuator-valve linkage is completely enclosed for safety, yet the packing adjustment is accessible without removing any parts.

**Specifications . . .** Refer to the table below and the actuator selection tables.

**Options . . .** ■ Top-mounted handwheel, ■ 1078 declutchable handwheel actuator, ■ Adjustable up- and down-travel stops, ■ Actuator locking mechanism that keeps the actuator in a locked position during maintenance, and ■ Pipe-away vent for remote venting of the actuator housing.

*Figure 9. Fisher 1051 Actuator*

**Accessories . . .** ■ Pneumatic and electro-pneumatic valve positioners, ■ FIELDVUE digital valve controllers, and ■ Limit and proximity switches.

*Table 5. Fisher 1051 Actuator Specifications*

| 1051 | 1052 | Bar | Psig | 1051 | 1052 | 1051 | 1052 | AMBIENT TEMPERATURES, °C | MATERIALS |
|---|---|---|---|---|---|---|---|---|---|
| 33 | 33 | ■0 to 1.2,■0 to 2.3, ■0 to 2.8, and ■0 to 3.8 | ■0 to 18, ■0 to 33, ■0 to 40, and ■0 to 55 | 4.5 | | 85 | 132 | **Nitrile:** –40 to 82 **Silicone:** –50 to 149 | **Diaphragm:** Nitrile (standard) or silicone **O-rings (for optional handwheel):** Nitrile or EPDM **Housing:** Cast iron (standard) or steel **Other Major Metal Parts:** Aluminum, steel, or cast iron |
| 40 | 40 | | | 5.2 | | 322 | 371 | | |
| 60 | 60 | ■0 to 1.2, ■ 0 to 2.3, and ■0 to 2.8 | ■ 0 to 11, ■0 to 33, and ■0 to 40 | 3.4 | | 626 | 730 | | |
| - - - | 70 | ■ 0 to 2.3, ■ 0 to 2.8, and ■ 0 to 3.8 | ■ 0 to 33, ■ 0 to 40, and ■ 0 to 55 | - - - | 4.5 | - - - | 1370 | | |

*Figure 10. Fisher 1052 Actuator, Size 33*

## Fisher 1061 Piston Actuators

The 1061 pneumatic rotary actuators are double-acting piston actuators that provide reliable operation for the valves in this flier.

The 1061 can be used with a two-position control signal for on-off operation or with a valve controller or positioner for throttling operation.

These actuators feature single-joint linkage with splined-and-clamped levers for minimum lost motion and high control accuracy.

The actuator-valve linkage is completely enclosed for safety, yet the packing adjustment is accessible without removing any parts.

**Specifications . . .** Refer to the table below and the actuator selection tables.

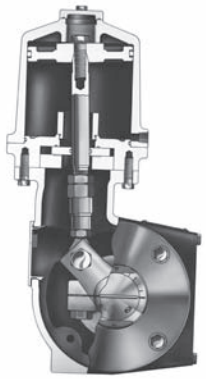



*Figure 11. Fisher 1061 Actuator*

**Options . . .** ■ 1078 declutchable handwheel actuator with cylinder bypass valve, ■ Adjustable up- and down-travel stops, ■ Actuator locking mechanism that keeps the actuator in a locked position during maintenance, and ■ Pipe-away vent for remote venting of the actuator housing.

**Accessories . . .** ■ Pneumatic and electro-pneumatic valve positioners and ■ Limit and proximity switches.

*Table 6. Fisher 1061 Actuator Specifications*

| ACTUATOR SIZE | CYLINDER OPERATING PRESSURE, BAR | | MAXIMUM VALVE BREAKOUT TORQUE, N•m | AMBIENT TEMPERATURES, °C | MATERIALS |
|---|---|---|---|---|---|
| | Minimum Recommended | Maximum Allowable | | | |
| 30 | **Without positioner:** 1.4 **With positioner:** 0.35 bar above actuator requirement | 6.9 | 232 | –34 to 82 (to –50 with optional materials) | **Cylinder and flange:** Aluminum **Piston:** Aluminum or nylon-coated aluminum **O-rings:** Nitrile **Mounting yoke bushing:** PTFE and steel **Sliding seal:** Brass **Other parts:** Iron, aluminum, and stainless steel |
| 40 | | 10.3 | 847 | | |
| 60 | | 6.9 | 1130 | | |
| 68 | | 5.9 | 1540 | | |
| 80 | | 10.3 | 5080 | | |
| 100 | | 10.3 | 6290 | | |

## FIELDVUE Digital Valve Controllers

W8755

**DVC2000**

W9418

**DVC6000 on Control-Disk VALVE**

*Figure 12. Fisher Digital Valve Controllers*

FIELDVUE digital valve controllers are communicating, microprocessor-based controllers that convert a current signal to a pressure signal to operate the actuator. Through digital communications, the controller gives easy access to actuator-valve information that is critical to operation.

Refer to following tables for FIELDVUE controller specifications.

**AMS ValveLink™ Software . . .** AMS ValveLink Software allows easy access to the information available from FIELDVUE digital valve controllers. The software provides diagnostic information such as dynamic error band and step response on easy-to-interpret screens. Tests can be run while the valve is operating, without disrupting the process. Access to diagnostics is through the 375 Field Communicator or a personal computer using AMS ValveLink Software.

**Options (contact your Emerson Process Management sales office for details on product specific options) . . .** ■ HART®, ■ FOUNDATION™ fieldbus, ■ remote mounting, ■ stainless steel housing, ■ Safety Instrumented System (SIS) applications, ■ Natural gas applications, ■ Performance Diagnostics, ■ extreme temperatures, and ■ low bleed relay.

### Approvals Available

Not all approvals are available on all FIELDVUE products. Contact your Emerson Process Management sales office for specific approvals.

| | |
|---|---|
| CSA | Explosion proof, Division 2, Dust-Ignition proof, Intrinsic Safety, Non-incentive |
| FM APPROVED | Explosion proof, Non-incendive, Dust-Ignition proof, Intrinsic Safety |
| ATEX | Flameproof, Type n, Intrinsic Safety |
| IECEx | Flameproof, Type n, Intrinsic Safety |
| Ex NEPSI | Flameproof, Intrinsic Safety |
| INMETRO | Flameproof, Intrinsic Safety |

**Fisher DVC2000 Electrical Housing:** Designed to meet IP66 (FM--approval pending for other agencies) NEMA 4X (approval pending). Contact your Emerson Process Management sales office for information on pending approvals.

**Fisher DVC6000 and DVC6000f Electrical Housing:** Meets NEMA 4X, CSA Type 4X, IEC 60529 IP66

**Natural Gas Approved:** The DVC6000 and DVC6000f are single-seal approved for use with natural gas. Contact your Emerson Process Management sales office for specific agency approval information.

## FIELDVUE Digital Valve Controllers (Continued)

*Table 7. Digital Valve Controller Electrical Specifications (HART® instruments Only)*

| ELECTRICAL INPUT POINT-TO-POINT CONNECTION | | | | | MULTI-DROP CONNECTION (DVC6000 ONLY) INSTRUMENT POWER | REVERSE POLARITY PROTECTION |
|---|---|---|---|---|---|---|
| **Analog Input Signal** | **Minimum Control Current** | **Minimum Current without Microprocessor Restart** | **Maximum Voltage** | **Overcurrent Protection** | | |
| 4 to 20 mA DC nominal | 4.0 mA | 3.5 mA | 30 VDC | Input circuit limits current to prevent internal damage | 11 to 30 VDC at approximately 8 mA | No damage occurs from reversal of loop current |

*Table 8. Digital Valve Controller Electrical Specifications (FOUNDATION ™ fieldbus Communication only)*

| COMMUNICATION PROTOCOL | POWER REQUIREMENTS | | | |
|---|---|---|---|---|
| | **Voltage Level** | **Maximum Current** | **Reverse Polarity Protection** | **Termination** |
| FOUNDATION fieldbus registered device<br>Physical Layer Type(s):<br>121—Low-power signaling, bus-powered, Entity Model I.S.<br>511—Low-power signaling, bus-powered, FISCO I.S. | 9 to 32 volts | 18 mA | Device is not polarity sensitive | Bus must be properly terminated per ISA SP50 guidelines |

## Valve Positioners

### Fisher 3610J, 3610JP, and 3620JP Valve Positioners

The 3610J single-acting pneumatic, 3610JP double-acting pneumatic, and 3620JP double-acting elector-pneumatic valve positioners are accurate, efficient positioners for use with 1051, 1052, 1061 actuators.

### Approvals Available

### Electrical Classification (Applies to the 3620JP)

| | |
|---|---|
| CSA | Intrinsic Safety, Explosion proof, Type n Dust-Ignition proof, DIV 2, |
| FM APPROVED | Intrinsic Safety, Explosion proof, Type n, Non-incendive, Dust-Ignition proof, |
| ATEX | Intrinsic Safety, Type n, Flameproof (Gas Atmospheres Only), |
| IECEx | Intrinsic Safety, Type n, Flameproof, (Gas Atmospheres Only), |
| INMETRO | Intrinsic Safety, Flameproof |

### Hazardous Area Classifications

The 3610J and 3620J valve positioners comply with the requirements of ATEX Group II Category 2 Gas and Dust

CE ⟨Ex⟩ II 2 G D

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*Figure 13. Fisher 3610J Pneumatic Valve Positioner and i2p-100 Electro-Pneumatic Transducer with 1052 Actuator and V300 Valve*

*Table 9. Fisher 3610J and 3620J Positioner Specifications*

| Type | Input Signal | | Supply Pressure | Operative Temperature | Weight | Connections |
|---|---|---|---|---|---|---|
| 3610J and 3610JP | ■ 0.2 to 1.0 or ■ 0.4 to 2.0 bar | ■ 3 to 15 or ■ 6 to 30 psig | 0.3 bar above the actuator requirement up to 10.3 bar maximum | −40 to 80°C | 2.5 kg | **Pressure and Vent Connections:** 1/4 NPT **3620J and JP Conduit:** 1/2 NPT |
| 3620J and 3620JP | 4 to 20 mA constant current with 30 VDC maximum compliance voltage; equivalent circuit is 120 ohms shunted by three 5.6 V zener diodes | | 0.3 bar above the actuator requirement up to 10.3 bar maximum | −40 to 80°C | 3.6 kg | |

*Table 10. Fisher 3610J and 3620J Capacities and Housing*

| Type | Supply Pressure, Bar | Supply Air Demand, $Nm^3/h$ | Air Consumption, $Nm^3/h$ | Housing (3620J and 3620JP) |
|---|---|---|---|---|
| 3610J and 3620J | 1.4 | 13 | **3610J:** 0.40 to 1.4 bar supply **3620J:** 0.49 at 1.4 bar supply | IP 54 per IEC 529 classification (weatherproof), NEMA 3; vent should be on the side or bottom for weatherproof applications |
| | 2.4 | 17 | | |
| 3610JP and 3620JP | 5.2 | 37 | **3610JP:** 0.64 at 6.9 bar supply **3620JP:** 0.93 at 6.9 bar supply | |
| | 6.9 | 46 | | |

## Other Accessories

**Fisher 67CFR Filter-Regulator . . .** The 67CFR provides constantly controlled supply pressure to actuator accessories system. This regulator features an internal filter and limited-capacity internal relief, allowing partial reduction of downstream pressure. Also featured is a Smart Bleed option that allows the actuated valve to fail to a desired safe position when inlet pressure is lost.

*Table 11. Fisher 67CFR Filter-Regulator Specifications*

| OUTLET PRESSURE SETTINGS | | MAXIMUM INLET PRESSURE (BODY RATING), BAR | MAXIMUM DIAPHRAGM PRESSURE, BAR | TEMPERATURE CAPABILITIES, °C | CONNECTIONS | MAXIMUM FLOW COEFFICIENT, $C_V$ | WEIGHT, kg |
|---|---|---|---|---|---|---|---|
| Bar | Psig | | | | | | |
| 0 to 1.4<br>0 to 2.4<br>0 to 4.1<br>0 to 8.6 | 0 to 20<br>0 to 35<br>0 to 60<br>0 to 125 | 17.2 | 3.4 over outlet setting | **Nitrile diaphragm and plug:** -29 to 82<br>**Fluorocarbon diaphragm, plug and PVDF, SST, or Glass Filter:** -18 to 149 | **Inlet and Outlet:** 1/4 NPT internal<br>**Vent:** Drilled hole or 1/4 NPT internal | 0.36 | 0.5 |

**Fisher 546, 646, 846, or i2P-100 Electro-Pneumatic Transducers . . .** These transducers convert a standard 4 to 20 mA DC signal to a proportional pneumatic signal. The 846 and i2P-100 transducers incorporate an explosive fluid process seal to meet safety regulations for use with natural gas as the pneumatic supply.

### Approvals Available

Not all approvals are available on all accessories. Contact your Emerson Process Management sales office for specific approvals.

Explosion proof, Division 2, Dust-Ignition proof, Intrinsic Safety, Type n

Explosion proof, Intrinsic Safety, Non-incendive, Dust-Ignition proof, Type n

ATEX Intrinsic Safety, Flameproof, and Type n

IECEx Intrinsic Safety, Flameproof, and Type n

INMETRO Intrinsic Safety, Flameproof

GOST Intrinsic Safety, Flameproof, and Type n

**Fisher 2625 Volume Booster . . .** The volume booster can be used in conjunction with a positioner to increase actuator stroking speed.

**Fisher C1 Pneumatic Controller . . .** The controller can sense pressure, differential pressure or vacuum and send pneumatic control signal to an adjacent valve or other control element.

**Others . . .** ■ High-pressure supply pressure regulators, ■ proximity switches, ■ microswitches, ■ solenoid valves, ■ signal volume boosters and ■ pneumatic pressure transmitters.

Contact your Emerson Process Management sales office for more information.

## Maximum Inlet Pressure for CW2M Valve Bodies

*Table 12. Maximum Inlet Pressure for CW2M Valve Bodies*

| TEMPERATURE, °C | MAXIMUM INLET PRESSURE, BAR | | | NOTE |
|---|---|---|---|---|
| | 150 | 300 | 600 | |
| −46 to 38 | 20.0 | 51.7 | 103 | CW2M is not listed in ASME B16.34. The designations 150, 300, and 600 indicate relative pressure-retaining capabilities and are not ASME pressure-temperature rating classes. |
| 93 | 17.9 | 51.7 | 103 | |
| 149 | 15.9 | 50.3 | 100 | |
| 204 | 13.8 | 48.6 | 97.2 | |
| 232 | 12.8 | 47.2 | 94.5 | |

## Shutoff Pressure Drop Limits for Trim Parts

**WARNING**

**Pressure drops in the following table consider only the trim parts (ball, shafts, bearings, and seals).**

**The pressure drops shown might be higher than the EN or ASME pressure–temperature rating of the valve body or mating flanges. Do not exceed the EN or ASME pressure-temperature rating of the valve or mating flanges, as exceeding the pressure-temperature rating may cause personal injury or equipment damage.**

In the following tables, the lower temperature limit is −10°C for EN valves, −29°C for ASME steel valves, and −46°C for ASME stainless steel valves.

Also refer to the actuator sizing pages to select an actuator size.

*Table 13. Pressure Drop in Bar (For HD Metal Seal, Pressure Drops are for Forward Flow Only. For Reverse HD Seal Flow, Limit Pressure Drop to 6.9 Bar)*

| BEARING MATERIAL | BALL SEAL | TEMPERATURE, °C | VALVE SIZE | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1 | 1-1/2 | 2 | 3 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 20 |
| | | | DN 25 | DN 40 | DN 50 | DN 80 | DN 100 | DN 150 | DN 200 | DN 250 | DN 300 | - - - | - - - | - - - |
| PEEK/PTFE | TCM Plus | -46 to 38 | 51.0 | 51.0 | 51.0 | 51.0 | 51.0 | 51.0 | 51.0 | 40.2 | 37.6 | 31.0 | 23.8 | 31.0 |
| | | 93 | 37.9 | 37.9 | 37.9 | 37.9 | 37.9 | 37.9 | 37.9 | 37.9 | 37.6 | 31.0 | 23.8 | 31.0 |
| | | 149 | 24.1 | 24.1 | 24.1 | 24.1 | 24.1 | 24.1 | 24.1 | 24.1 | 24.1 | 24.1 | 23.8 | 24.1 |
| | | 204 | 10.3 | 10.3 | 10.3 | 10.3 | 10.3 | 10.3 | 10.3 | 10.3 | 10.3 | 10.3 | 10.3 | 10.3 |
| | | 232 | 3.45 | 3.45 | 3.45 | 3.45 | 3.45 | 3.45 | 3.45 | 3.45 | 3.45 | 3.45 | 3.45 | 3.45 |
| | HD Metal | -46 to 288 | 51.0 | 51.0 | 51.0 | 51.0 | 51.0 | 51.0 | 51.0 | 40.9 | 38.1 | 40.3 | 26.5 | 40.3 |
| | Flat Metal | -29 to 260 | - - - | - - - | - - - | 20.7 | 20.7 | 20.7 | 20.7 | 10.3 | 10.3 | - - - | - - - | - - - |
| | Flow Ring | - - - | 99.3 | 99.3 | 99.3 | 99.3 | 72.4 | 75.2 | 73.8 | 40.5 | 37.7 | 40.5 | 35.0 | 44.7 |
| R30006 | HD Metal | -46 to 288 | 51.0 | 50.0 | 25.7 | 17.5 | 11.0 | 10.9 | 11.2 | 6.14 | 5.72 | 6.14 | 7.52 | 6.83 |
| | Flat Metal | -29 to 260 | - - - | - - - | - - - | 17.0 | 10.1 | 10.7 | 10.6 | 5.86 | 5.52 | - - - | - - - | - - - |
| | Flow Ring | - - - | 74.5 | 49.6 | 26.8 | 18.8 | 10.9 | 11.2 | 11.1 | 6.07 | 5.65 | 6.07 | 7.31 | 6.69 |
| R30006 Silver Plated | HD Metal | -46 to 288 | 51.0 | 51.0 | 51.0 | 35.0 | 22.1 | 21.8 | 22.5 | 12.3 | 11.4 | 12.3 | 13.2 | 13.7 |
| | Flat Metal | -29 to 260 | - - - | - - - | - - - | 20.7 | 20.1 | 20.7 | 20.7 | 10.3 | 10.3 | - - - | - - - | - - - |
| | Flow Ring | - - - | 99.3 | 99.3 | 53.5 | 37.6 | 21.8 | 22.5 | 22.2 | 12.1 | 11.3 | 12.1 | 14.6 | 13.4 |
| S44004 | HD Metal | -46 to 288 | 51.0 | 51.0 | 51.0 | - - - | - - - | - - - | - - - | - - - | - - - | 20.5 | 13.2 | 14.0 |
| | Flat Metal | -29 to 260 | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - |
| | Flow Ring | - - - | 99.3 | 99.3 | 88.9 | - - - | - - - | - - - | - - - | - - - | - - - | 20.2 | 20.1 | 22.3 |
| S31600L Nitride | HD Metal | -46 to 288 | - - - | - - - | - - - | 51.0 | 36.7 | 36.3 | 37.4 | 20.5 | 19.1 | - - - | - - - | - - - |
| | Flat Metal | -29 to 260 | - - - | - - - | - - - | 20.7 | 20.7 | 20.7 | 20.7 | 10.3 | 10.3 | - - - | - - - | - - - |
| | Flow Ring | - - - | - - - | - - - | - - - | 62.7 | 36.3 | 37.4 | 37.0 | 20.2 | 18.8 | - - - | - - - | - - - |

## Flow Coefficients

*Table 14. Fisher V150, V200, and V300 (Forward Flow)*

| VALVE SIZE | | VALVE ROTATION, DEGREES (LINE SIZE EQUALS VALVE SIZE) | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 10 | 30 | 60 | 90 | 10 | 30 | 60 | 90 | 10 | 30 | 60 | 90 | 10 | 30 | 60 | 90 |
| DN | NPS | $C_v$ | | | | $K_v$ | | | | $F_L$ | | | | $X_T$ | | | |
| **Composition Seals, Flat Metal Seals (DN 50 - DN 300 and NPS 3 - 12), and Flow Ring Construction** | | | | | | | | | | | | | | | | | |
| 25[1] | 1[1] | .0098 | 2.53 | 12.4 | 34.6 | .0085 | 2.19 | 10.7 | 29.9 | .93 | .90 | .84 | .69 | .392 | .571 | .507 | .275 |
| 40[1] | 1-1/2[1] | .014 | 6.15 | 27.8 | 76.0 | .012 | 5.32 | 24.0 | 65.7 | .87 | .86 | .82 | .73 | .492 | .548 | .516 | .328 |
| 50[1] | 2[1] | .028 | 9.60 | 46.1 | 123 | .024 | 8.30 | 39.9 | 106 | .94 | .90 | .83 | .75 | .386 | .585 | .559 | .366 |
| 80 | 3 | .746 | 27.7 | 120 | 321 | .645 | 24.0 | 104 | 278 | .91 | .88 | .80 | .74 | .664 | .628 | .501 | .302 |
| 100 | 4 | 3.56 | 47.2 | 195 | 596 | 3.08 | 40.8 | 169 | 516 | .88 | .90 | .80 | .62 | .697 | .792 | .518 | .221 |
| 150 | 6 | 5.34 | 82.1 | 340 | 1100 | 4.62 | 71.0 | 294 | 952 | .93 | .91 | .80 | .58 | .574 | .770 | .518 | .200 |
| 200 | 8 | 6.99 | 122 | 518 | 1820 | 6.05 | 106 | 448 | 1570 | .89 | .90 | .82 | .54 | .526 | .735 | .537 | .176 |
| 250 | 10 | 43.5 | 252 | 1000 | 3000 | 37.6 | 218 | 865 | 2600 | .85 | .88 | .80 | .56 | .219 | .735 | .473 | .189 |
| 300 | 12 | 44.2 | 390 | 1530 | 3980 | 38.2 | 337 | 1320 | 3440 | .81 | .83 | .78 | .63 | .366 | .632 | .490 | .245 |
| - - - | 14 | 60.0 | 541 | 1670 | 5610 | 51.9 | 468 | 1450 | 4850 | .89 | .79 | .80 | .37 | .999 | .605 | .593 | .198 |
| - - - | 16 | 70.0 | 692 | 2380 | 8270 | 60.6 | 599 | 2060 | 7150 | .89 | .79 | .80 | .37 | .273 | .566 | .452 | .133 |
| - - - | 20 | 110 | 993 | 3070 | 10,300 | 95.2 | 859 | 2660 | 8910 | .89 | .79 | .80 | .73 | .999 | .605 | .593 | .198 |
| **HD (Heavy-Duty) Metal Seats** | | | | | | | | | | | | | | | | | |
| | | $C_v$ | | | | | | | | $F_L$ | | | | $X_T$ | | | |
| 25 | 1[1] | .0503 | 2.53 | 11.3 | 33.1 | .0435 | 2.19 | 9.77 | 28.6 | .95 | .94 | .88 | .68 | .829 | .687 | .553 | .243 |
| 40 | 1-1/2[1] | .0180 | 4.20 | 23.2 | 70.8 | .0156 | 3.63 | 20.1 | 61.2 | .91 | .94 | .87 | .70 | .591 | .683 | .561 | .265 |
| 50 | 2[1] | .020 | 6.75 | 40.4 | 122 | .017 | 5.84 | 34.9 | 106 | .89 | .91 | .87 | .72 | .749 | .589 | .558 | .314 |
| 80 | 3 | .169 | 24.1 | 112 | 338 | .146 | 20.8 | 96.9 | 292 | .96 | .91 | .82 | .73 | .710 | .597 | .563 | .278 |
| 100 | 4 | .108 | 34.2 | 158 | 539 | .093 | 29.6 | 137 | 466 | .89 | .94 | .82 | .64 | .941 | .718 | .605 | .233 |
| 150 | 6 | .996 | 56.9 | 290 | 1070 | .862 | 49.2 | 251 | 925 | .94 | .95 | .84 | .58 | .578 | .788 | .544 | .185 |
| 200 | 8 | 1.41 | 94.7 | 481 | 1750 | 1.22 | 81.9 | 416 | 1510 | .96 | .89 | .80 | .51 | .348 | .693 | .508 | .158 |
| 250 | 10 | 7.28 | 199 | 897 | 2950 | 6.30 | 172 | 776 | 2550 | .97 | .90 | .79 | .54 | .107 | .664 | .494 | .174 |
| 300 | 12 | 7.48 | 291 | 1300 | 4010 | 6.47 | 252 | 1120 | 3470 | .97 | .92 | .82 | .60 | .800 | .710 | .508 | .228 |
| - - - | 14 | 56.0 | 502 | 1550 | 5200 | 48.4 | 434 | 1340 | 4500 | .89 | .79 | .80 | .37 | .999 | .605 | .593 | .198 |
| - - - | 16 | 30.0 | 600 | 2040 | 7840 | 26.0 | 519 | 1770 | 6780 | .89 | .79 | .80 | .37 | .965 | .593 | .533 | .135 |
| - - - | 20 | 105 | 942 | 2910 | 9770 | 90.8 | 815 | 2520 | 8450 | .89 | .79 | .80 | .37 | 999 | .605 | .593 | 1.98 |
| **Micro-Notch V-Notch Ball (Metal Ball with Composition or HD (Heavy-Duty) Metal Seal** | | | | | | | | | | | | | | | | | |
| | | $C_v$ | | | | | | | | $F_L$ | | | | $X_T$ | | | |
| 25 | 1 | .0143 | .360 | 1.43 | 5.23 | .0124 | .311 | 1.24 | 4.52 | .95 | .93 | .90 | .88 | .551 | .660 | .620 | .578 |
| **Micro-Notch V-Notch Ball (Ceramic Ball with HD (Heavy-Duty) Metal Seal** | | | | | | | | | | | | | | | | | |
| | | $C_v$ | | | | | | | | $F_L$ | | | | $X_T$ | | | |
| 25 | 1 | .0180 | .415 | 1.78 | 3.64 | .0156 | .389 | 1.54 | 3.15 | .90 | .94 | .90 | .92 | .581 | .693 | .612 | 6.12 |

1. The coefficient listed for 10 degrees was measured at 12 degrees rotation.

## Conversion of Sizing Coefficients

Following are conversions for use with other common sizing equations.

$K_v = (0.865)C_v$

$C_1 = 39.76(\sqrt{X_T})$

$C_g = C_v C_1$

$K_m = F_L^2$

$C_s = 1/20(C_g)$. $C_s$ is only applicable for inlet pressures up to 70 bar(a)

## Line-to-Valve Size Ratios Greater than 1-to-1

Contact your Emerson Process Management sales office for information on determining the $F_P$, the piping geometry factor.

## Actuator-Valve Selection — Shutoff Pressure Drops

**Note**

**The intent of the actuator-valve selection tables is to present an actuator size that will control a relatively high valve pressure drop with a standard actuator operating pressure. It is not implied that the selection shown is best for your application.**

**For pressure drops lower than those shown, a lower actuator pressure or smaller actuator might be satisfactory.**

**For pressure drops higher than those shown, a higher operating pressure or larger actuator will be required.**

**Contact your Emerson Process Management sales office for other sizes and operating pressures.**

With rotary valves, the highest pressure drop occurs when the valve is shut off. When the valve is open, pressure drop is normally much lower. However, pressure drop capabilities of a rotary valve also are lower when the valve is open. The allowable flowing pressure drop across a valve depends on the valve construction, on the type of flowing fluid (liquid or gas), and on the vapor pressure and critical pressure ratio of liquids.

Only allowable shutoff pressure drops are shown here. To determine the allowable flowing pressure drop, provide your Emerson Process Management sales office with the application information shown on page 23.

Do not exceed any other limits presented in this flier. Following is a brief reminder of some of those limits:

**Maximum Shutoff Pressure Drop . . .** Do not exceed any of the pressure drops in these tables or in the Maximum Allowable Shutoff Pressure Drops section.

**Maximum Inlet Pressure and Temperature . . .** Do not exceed the maximum rating of the valve: PN 10 through 100 or CL150 through CL600. Refer to the Body Materials, End Connections, and Ratings section.

**Materials Temperature Limits . . .** Refer to the Valve Materials and Temperatures section, the actuator specifications tables, and the accessories specifications tables. Some of the critical limits are repeated here.

*Table 15. Temperature Capabilities Summary*

<table>
<tr><td rowspan="12">PROCESS TEMPERATURE</td><td rowspan="2">Minimum for all types</td><td>Steel valve material</td><td colspan="4">EN: –10°C<br>ASME: –29°C</td></tr>
<tr><td>Stainless steel valve material</td><td colspan="4">EN: –10°C<br>ASME: –26°C</td></tr>
<tr><td rowspan="10">Maximum</td><td>Valve</td><td>Packing</td><td colspan="2">Bearing</td><td>- - -</td></tr>
<tr><td rowspan="6">CV500 and V500</td><td rowspan="2">PTFE</td><td colspan="2">PTFE</td><td>232°C</td></tr>
<tr><td colspan="2">Metal</td><td>260°C</td></tr>
<tr><td rowspan="3">Graphite</td><td colspan="2">PTFE</td><td>232°C</td></tr>
<tr><td rowspan="2">Metal</td><td>CV500</td><td>316°C (260°C with CF8M retainer)</td></tr>
<tr><td>V500</td><td>427°C</td></tr>
<tr><td rowspan="2">O-rings for sealed bearing</td><td>Nitrile</td><td>–29 to 93°C</td></tr>
<tr><td>Fluorocarbon</td><td>–18 to 204°C</td></tr>
<tr><td rowspan="4">AMBIENT TEMPERATURE</td><td colspan="2">1051 and 1052 actuators</td><td colspan="4">–40 to 82°C with nitrile elastomers and –50 to 149°C with silicone</td></tr>
<tr><td colspan="2">2052 actuator</td><td colspan="4">–45 to 80°C</td></tr>
<tr><td colspan="2">1061 actuator</td><td colspan="4">–34 to 82°C (to –50°C with optional materials)</td></tr>
<tr><td colspan="2">DVC6020 controller and 3610J positioners</td><td colspan="4">–40 to 80°C</td></tr>
</table>

## Actuator-Valve Selection — Shutoff Pressure Drops (Continued)

*Table 16. Fisher 2052 Actuator*

| BEARING AND SEAL MATERIAL | VALVE SIZE | | PUSH–DOWN–TO–OPEN OR -CLOSE | | | |
|---|---|---|---|---|---|---|
| | | | Actuator Size | Air–to–Diaphragm | | Pressure Drop, Bar |
| | DN | NPS | | Bar | Psig | |
| PEEK Bearings with TCM Plus Seal | 25 | 1 | 1 | 2 | 30 | 51.7 |
| | 40 | 1-1/2 | 1 | 4 | 60 | 51.7 |
| | 50 | 2 | 1 | 4 | 60 | 51.7 |
| | 80 | 3 | 2 | 2 | 30 | 51.7 |
| | 100 | 4 | 2 | 4 | 60 | 51.7 |
| | 150 | 6 | 3 | 2 | 30 | 51.7 |
| | 200 | 8 | 3 | 4 | 60 | 51.7 |
| | 250 | 10 | 3 | 4 | 60 | 40.2 |
| | 300 | 12 | 3 | 4 | 60 | 37.6 |
| PEEK Bearings with HD (Heavy–Duty) Metal Seal | 25 | 1 | 1 | 2 | 30 | 51.7 |
| | 40 | 1-1/2 | 1 | 4 | 60 | 51.7 |
| | 50 | 2 | 1 | 4 | 60 | 51.7 |
| | 80 | 3 | 2 | 2 | 30 | 51.7 |
| | 100 | 4 | 2 | 4 | 60 | 51.7 |
| | 150 | 6 | 3 | 2 | 30 | 51.7 |
| | 200 | 8 | 3 | 4 | 60 | 51.7 |
| | 250 | 10 | 3 | 4 | 60 | 40.9 |
| | 300 | 12 | 3 | 4 | 60 | 33.1 |
| PEEK Bearings with Flat Metal Seal | 80 | 3 | 2 | 2 | 30 | 20.7 |
| | 100 | 4 | 2 | 4 | 60 | 20.7 |
| | 150 | 6 | 3 | 2 | 30 | 20.7 |
| | 200 | 8 | 3 | 4 | 60 | 20.7 |
| | 250 | 10 | 3 | 4 | 60 | 10.3 |
| | 300 | 12 | 3 | 4 | 60 | 8.9 |
| PEEK Bearings with Flow Ring Construction | 25 | 1 | 1 | 2 | 30 | 103.4 |
| | 40 | 1-1/2 | 1 | 4 | 60 | 103.4 |
| | 50 | 2 | 1 | 4 | 60 | 103.4 |
| | 80 | 3 | 2 | 2 | 30 | 103.4 |
| | 100 | 4 | 2 | 4 | 60 | 72.4 |
| | 150 | 6 | 3 | 2 | 30 | 75.2 |
| | 200 | 8 | 3 | 4 | 60 | 73.8 |
| | 250 | 10 | 3 | 4 | 60 | 40.5 |
| | 300 | 12 | 3 | 4 | 60 | 37.7 |

## Actuator-Valve Selection — Shutoff Pressure Drops (Continued)

*Table 17. Fisher 1052 Actuator*

| BEARING AND SEAL MATERIAL | VALVE SIZE | | AIR TO OPEN (PUSH-DOWN-TO-OPEN) | | | | AIR TO CLOSE (PUSH-DOWN-TO-CLOSE) | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Actuator Size | Pressure to Actuator | | Pressure Drop, Bar | Actuator Size | Pressure to Actuator | | Pressure Drop, Bar |
| | DN | NPS | | Bar | Psig | | | Bar | Psig | |
| PEEK Bearings with Composition Seal | 25 | 1 | 20 | 0 to 1.2 | 0 to 18 | 51.0 | 20 | 0 to 1.2 | 0 to 18 | 51.0 |
| | 40 | 1-1/2 | 20 | 0 to 1.2 | 0 to 18 | 51.0 | 33 | 0 to 1.2 | 0 to 18 | 51.0 |
| | 50 | 2 | 33 | 0 to 1.2 | 0 to 18 | 51.0 | 33 | 0 to 1.2 | 0 to 18 | 51.0 |
| | 80 | 3 | 33 | 0 to 1.2 | 0 to 18 | 51.0 | 40 | 0 to 1.2 | 0 to 18 | 51.0 |
| | 100 | 4 | 40 | 0 to 1.2 | 0 to 18 | 51.0 | 40 | 0 to 1.2 | 0 to 18 | 51.1 |
| | 150 | 6 | 60 | 0 to 1.2 | 0 to 18 | 51.0 | 60 | 0 to 1.2 | 0 to 18 | 43.3 |
| | 200 | 8 | 60 | 0 to 1.2 | 0 to 18 | 51.0 | 60 | 0 to 2.3 | 0 to 33 | 51.0 |
| | 250 | 10 | 70 | 0 to 2.3 | 0 to 33 | 51.0 | 60 | 0 to 2.3 | 0 to 33 | 51.0 |
| | 300 | 12 | 70 | 0 to 2.3 | 0 to 33 | 46.9 | 70 | 0 to 2.3 | 0 to 33 | 51.0 |
| PEEK Bearings with HD (Heavy-Duty) Metal Seal (Lubricated Service) | 50 | 2 | 20 | 0 to 1.2 | 0 to 18 | 51.0 | 33 | 0 to 1.2 | 0 to 18 | 51.0 |
| | 80 | 3 | 33 | 0 to 1.2 | 0 to 18 | 51.0 | 40 | 0 to 1.2 | 0 to 18 | 51.0 |
| | 100 | 4 | 40 | 0 to 1.2 | 0 to 18 | 51.0 | 40 | 0 to 1.2 | 0 to 18 | 51.0 |
| | 150 | 6 | 60 | 0 to 1.2 | 0 to 18 | 51.0 | 60 | 0 to 1.2 | 0 to 18 | 51.0 |
| | 200 | 8 | 70 | 0 to 2.3 | 0 to 33 | 51.0 | 60 | 0 to 2.3 | 0 to 33 | 51.0 |
| | 250 | 10 | 70 | 0 to 2.3 | 0 to 33 | 51.0 | 70 | 0 to 2.3 | 0 to 33 | 15.3 |
| | 300 | 12 | 70 | 0 to 2.3 | 0 to 33 | 35.2 | 70 | 0 to 2.3 | 0 to 33 | 26.5 |
| PEEK Bearings with HD (Heavy-Duty) Metal Seal (Non-Lubricated Service) | 50 | 2 | 20 | 0 to 1.2 | 0 to 18 | 51.0 | 33 | 0 to 1.2 | 0 to 18 | 51.0 |
| | 80 | 3 | 40 | 0 to 1.2 | 0 to 18 | 51.0 | 40 | 0 to 1.2 | 0 to 18 | 51.0 |
| | 100 | 4 | 40 | 0 to 1.2 | 0 to 18 | 51.0 | 60 | 0 to 1.2 | 0 to 18 | 51.0 |
| | 150 | 6 | 60 | 0 to 1.2 | 0 to 18 | 51.0 | 60 | 0 to 1.2 | 0 to 18 | 51.0 |
| | 200 | 8 | 70 | 0 to 2.3 | 0 to 33 | 51.0 | 70 | 0 to 2.3 | 0 to 33 | 51.0 |
| | 250 | 10 | 70 | 0 to 2.3 | 0 to 33 | 51.0 | 70 | 0 to 2.3 | 0 to 33 | 43.6 |
| | 300 | 12 | 70 | 0 to 2.3 | 0 to 33 | 26.6 | 70 | 0 to 2.3 | 0 to 33 | 18.1 |
| PEEK Bearings with Flat Metal Seal | 25 | 1 | 20 | 0 to 1.2 | 0 to 18 | 20.7 | 33 | 0 to 1.2 | 0 to 18 | 20.7 |
| | 40 | 1-1/2 | 33 | 0 to 1.2 | 0 to 18 | 20.7 | 33 | 0 to 1.2 | 0 to 18 | 20.7 |
| | 50 | 2 | 33 | 0 to 1.2 | 0 to 18 | 20.7 | 33 | 0 to 1.2 | 0 to 18 | 20.7 |
| | 80 | 3 | 40 | 0 to 1.2 | 0 to 18 | 20.7 | 40 | 0 to 1.2 | 0 to 18 | 20.7 |
| | 100 | 4 | 60 | 0 to 1.2 | 0 to 18 | 20.7 | 60 | 0 to 1.2 | 0 to 18 | 20.7 |
| | 150 | 6 | 60 | 0 to 1.2 | 0 to 18 | 20.7 | 60 | 0 to 2.3 | 0 to 33 | 20.7 |
| | 200 | 8 | 60 | 0 to 2.3 | 0 to 33 | 20.7 | 60 | 0 to 2.3 | 0 to 33 | 20.7 |
| | 250 | 10 | 60 | 0 to 2.3 | 0 to 33 | 10.3 | 60 | 0 to 2.3 | 0 to 33 | 10.3 |
| | 300 | 12 | 70 | 0 to 2.3 | 0 to 33 | 9.3 | 70 | 0 to 2.3 | 0 to 33 | 7.5 |
| PEEK Bearings with Flow Ring Construction | 25, 40 | 1, 1-1/2 | 20 | 0 to 1.2 | 0 to 18 | 51.0 | 20 | 0 to 1.2 | 0 to 18 | 50.1 |
| | 50 | 2 | 20 | 0 to 1.2 | 0 to 18 | 51.0 | 33 | 0 to 1.2 | 0 to 18 | 50.1 |
| | 80 | 3 | 33 | 0 to 1.2 | 0 to 18 | 51.0 | 33 | 0 to 1.2 | 0 to 18 | 50.1 |
| | 100 | 4 | 40 | 0 to 1.2 | 0 to 18 | 51.0 | 40 | 0 to 1.2 | 0 to 18 | 50.1 |
| | 150 | 6 | 60 | 0 to 1.2 | 0 to 18 | 51.0 | 60 | 0 to 1.2 | 0 to 18 | 50.1 |
| | 200 | 8 | 60 | 0 to 1.2 | 0 to 18 | 51.0 | 60 | 0 to 2.3 | 0 to 33 | 50.1 |
| | 250 | 10 | 70 | 0 to 2.3 | 0 to 33 | 51.0 | 60 | 0 to 2.3 | 0 to 33 | 50.1 |
| | 300 | 12 | 70 | 0 to 2.3 | 0 to 33 | 51.0 | 70 | 0 to 2.3 | 0 to 33 | 50.1 |

## Actuator-Valve Selection — Shutoff Pressure Drops (Continued)

*Table 18. Fisher 1061 Actuator*

| VALVE SIZE | | 1061 SIZE | PRESSURE TO ACTUATOR | | PRESSURE DROP, BAR | 1061 SIZE | PRESSURE TO ACTUATOR | | PRESSURE DROP, BAR | 1061 SIZE | PRESSURE TO ACTUATOR | | PRESSURE DROP, BAR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Bar | Psig | | | Bar | Psig | | | Bar | Psig | |
| **DN** | **NPS** | **Composition Seal** | | | | **HD (Heavy-Duty) Metal Seal (Lubricated Service)** | | | | **HD (Heavy-Duty) Metal Seal (Non-Lubricated Service)** | | | |
| 25 | 1 | 30 | 4.1 | 60 | 51.0 | 30 | 4.1 | 60 | 51.0 | 30 | 4.1 | 60 | 51.0 |
| 40 | 1-1/2 | 30 | 4.1 | 60 | 51.0 | 30 | 4.1 | 60 | 51.0 | 30 | 4.1 | 60 | 51.0 |
| 50 - 100 | 2 - 4 | 30 | 4.1 | 60 | 51.0 | 30 | 4.1 | 60 | 51.0 | 30 | 4.1 | 60 | 51.0 |
| 150 | 6 | 30 | 5.5 | 80 | 51.0 | 30 | 4.1 | 60 | 51.0 | 30 | 4.1 | 60 | 51.0 |
| 200 | 8 | 30 | 5.5 | 80 | 47.9 | 40 | 4.1 | 60 | 51.0 | 40 | 4.1 | 60 | 48.3 |
| 250 | 10 | 40 | 4.1 | 60 | 51.0 | 40 | 5.5 | 80 | 40.5 | 60 | 4.1 | 60 | 51.0 |
| 300 | 12 | 60 | 4.1 | 60 | 51.0 | 68 | 4.1 | 60 | 51.0 | 68 | 4.1 | 60 | 51.0 |
| | | **Flat Metal Seal** | | | | **Flow Ring Construction** | | | | **- - -** | | | |
| 25, 40 | 1, 1-1/2 | 30 | 4.1 | 60 | 20.7 | 30 | 4.1 | 60 | 51.0 | - - - | | | |
| 50 - 150 | 2 - 6 | 30 | 4.1 | 60 | 20.7 | 30 | 4.1 | 60 | 51.0 | | | | |
| 200 | 8 | 40 | 4.1 | 60 | 20.7 | 40 | 4.1 | 60 | 51.0 | - - - | | | |
| 250 | 10 | 40 | 4.1 | 60 | 10.3 | 40 | 4.1 | 60 | 51.0 | | | | |
| 300 | 12 | 60 | 4.1 | 60 | 9.9 | 40 | 4.1 | 60 | 43.4 | | | | |

## Approximate Weight

Weights are in kilograms and are for valve and actuator combined (CL150 flanged for V150 valves, CL300 flangeless for V200, and CL300 flanged for V300 valves). Not all possible valve and actuator size combinations are shown.

*Table 19. Fisher V150, V200, V300 with Actuator*

| VALVE SIZE | | 2052 ACTUATOR | | | | 1051 ACTUATOR | | | | 1052 ACTUATOR | | | | 1061 ACTUATOR | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DN | NPS | Size | V150 | V200 | V300 | Size | V150 | V200 | V300 | Size | V150 | V200 | V300 | SIze | V150 | V200 | V300 |
| 25 | 1 | 1 | 28 | 27 | 30 | 33<br>40 | 26<br>49 | 25<br>48 | 28<br>51 | 20<br>30 | 20<br>27 | 19<br>26 | 22<br>29 | 30 | 28 | 27 | 30 |
| 40 | 1-1/2 | 1 | 30 | 29 | 34 | 33<br>40 | 28<br>51 | 26<br>49 | 32<br>55 | 20<br>30 | 22<br>29 | 20<br>27 | 26<br>33 | 30 | 30 | 28 | 34 |
| 50 | 2 | 1 | 31 | 32 | 39 | 33<br>40 | 29<br>52 | 30<br>53 | 37<br>60 | 20<br>30 | 23<br>30 | 24<br>31 | 31<br>38 | 30 | 31 | 32 | 39 |
| 80 | 3 | 2 | 58 | 60 | 73 | 33<br>40<br>60 | 33<br>56<br>102 | 35<br>58<br>104 | 43<br>71<br>117 | 33<br>40 | 34<br>58 | 36<br>60 | 49<br>73 | 30 | 35 | 37 | 50 |
| 100 | 4 | 2 | 71 | 67 | 82 | 40<br>60 | 69<br>115 | 65<br>111 | 80<br>126 | 40<br>60 | 71<br>118 | 67<br>114 | 82<br>129 | 30 | 48 | 44 | 59 |
| 150 | 6 | 3 | 130 | 124 | 148 | 40<br>60 | 85<br>131 | 79<br>125 | 103<br>149 | 60 | 134 | 128 | 152 | 30 | 64 | 58 | 82 |
| 200 | 8 | 3 | 160 | 150 | 191 | 60 | 161 | 151 | 192 | 60<br>70 | 164<br>195 | 154<br>185 | 195<br>226 | 30<br>40 | 94<br>101 | 84<br>91 | 125<br>132 |
| 250 | 10 | 3 | 195 | 202 | 288 | 60 | 196 | 203 | 289 | 60<br>70 | 199<br>230 | 206<br>237 | 292<br>323 | 40<br>60 | 136<br>146 | 143<br>153 | 229<br>239 |
| 300 | 12 | 3 | 245 | - - - | 381 | 60 | 246 | - - - | 382 | 70 | 280 | - - - | 416 | 40<br>60<br>68 | 186<br>196<br>213 | - - -<br>- - -<br>- - - | 322<br>332 |
| - - - | 14 | - - - | - - - | - - - | - - - | 60 | 336 | - - - | 463 | 60 | 339 | - - - | 466 | 68 | 303 | - - - | 349<br>430 |
| - - - | 16 | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | 80<br>100 | 455<br>468 | - - -<br>- - - | 632<br>645 |
| - - - | 20 | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | - - - | 80<br>100 | 646<br>659 | - - -<br>- - - | - - -<br>- - - |

## Dimensions

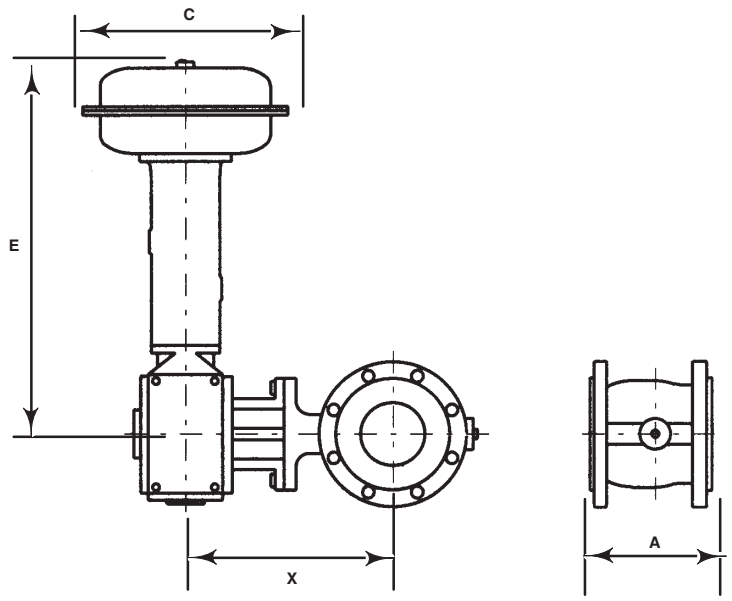


*Figure 14. Dimensions*

*Table 20. Dimensions C and E (mm)*

| Actuator Type | Actuator Size | C | E |
|---|---|---|---|
| 1051 | 33 | 289 | 338 |
| | 40 | 333 | 505 |
| | 60 | 473 | 749 |
| 1052 | 20 | 251 | 256 |
| | 33 | 289 | 338 |
| | 40 | 333 | 607 |
| | 60 | 473 | 876 |
| | 70 | 536 | 849 |
| 1061 | 30 | 171 | 378 |
| | 40 | 206 | 425 |
| | 60 | 267 | 406 |
| 2052 | 1 | 245 | 258 |
| | 2 | 350 | 423 |
| | 3 | 490 | 592 |
| 1061 | 68 | 324 | 483 |
| | 80 | 324 | 714 |
| | 100 | 381 | 714 |

*Table 21. Dimensions A, X for Fisher V150, V200, V300*

| VALVE SIZE | | A | | | | | |
|---|---|---|---|---|---|---|---|
| | | Standard | | Optional | | | |
| DN | NPS | V150 | V200 | V150 | V200 CL150 Only | V300 (IEC 534-3-2 & ISA S75.04) | X |
| 25 | 1 | 102 | | 127 | | 102 | 232 |
| 40 | 1-1/2 | 114 | | 165 | | 114 | 258 |
| 50 | 2 | 124 | | 178 | | 124 | 264 |
| 80 | 3 | 165 | | 203 | | 165 | 290 |
| 100 | 4 | 194 | | 229 | | 194 | 301 |
| 150 | 6 | 229 | | 267 | | 229 | 324 |
| 200 | 8 | 243 | | 292 | | 243 | 380 |
| 250 | 10 | 297 | 297 | 330 | 330 | 297 | 408 |
| 300 | 12 | 338 | - - - | 356 | - - - | 338 | 451 |
| - - - | 14 | 381 | - - - | - - - | - - - | 381 | 629 |
| - - - | 16 | 406 | - - - | - - - | - - - | 406 | 601 |
| - - - | 20 | 508 | - - - | - - - | - - - | - - - | 692 |

For V150 and V200 valves through DN 300 (NPS 12), the standard face-to-face dimension is IEC 534-3-2 (ISA S75.04). The optional face-to-face dimension for these sizes is ISA B16.10 Short. The face-to-face dimension for DN 350 and DN 400 (NPS 14 and 16) is ISA B16.10 Short. The face-to-face dimension for DN 500 (NPS 20) is 508 mm. Face-to-face dimensions for EN versions of these valves are the same as for the ASME versions and might not conform to any standard other than those mentioned here.

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